SURVEY OF RESEARCH IN RESIDENTIAL SCHOOLS FOR THE BLIND

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PREFACE

This monograph is the twelfth in a series of studies published by the New York Institute for the Education of the Blind.

The aim of this series is to make available, to workers and students in the field of education of the blind, the literature from other languages and worthwhile English publications dealing with the methods of teaching the blind. The Board of Managers, in making this series possible, presents the view of each author as the author's opinion and not the opinion of the Board of Managers of the New York Institute for the Education of the Blind. In some cases it is possible that the philosophy and general educational policy of the school may be different than the view expressed by the author of the monograph.

In this monograph Dr. Clarence Athearn has in a comprehensive way analyzed the research efforts in our professional field. Dr. Athearn's many years of teaching and administrative experience in general and special education coupled with his many research contributions make his analysis, and conclusions on research in our residential schools of the highest importance to all administrative officers and teachers. The treatment of our field from this point of view has been far too long neglected. This monograph makes a vital contribution to our professional leadership and adds an important study to our growing professional literature.

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Survey of Research in Residential Schools for the Blind

By: CLARENCE R. ATHEARN

A. INTRODUCTION

1. *Purpose of this Survey.*

Problems of research and experimentation are of fundamental importance to the progress of the education of the blind.

The purpose of this paper is to survey the major types of research which have been conducted by residential schools for the blind (or with the cooperation of such schools), and to cite some of the outstanding examples of each type. From this study we should be able to gain some suggestions as to the factors involved in successful research; and some notions as to the areas in which fruitful research may be guided in the future.

2. *Scientific Research and Service Studies.*

At this point, it may be well to indicate the distinction between strictly scientific research and research service studies aimed to help solve the urgent day-to-day problems of the teacher and the school.

Strictly scientific research undertakes to test the fundamental theories and basic assumptions underlying educational processes. It seeks to establish universal principles. Hence scientific studies of this character commonly involve large numbers of pupils, long intervals of time, and wide geographic distribution of data, in the effort to eliminate variable factors. In order to measure the actual effects of various factors in the learning process, exact and reliable instruments of measurement are essential. The cooperation of many schools for the blind over a period of years is essential in order that reliable data for scientific work may be obtained.

But by far the larger portion of research projects in schools for the blind may be described as service studies. The service study is scientific in method, but differs from strictly objective scientific research

in degree and extent. The service study starts with certain assumptions, and does not aim to establish universal laws. The problems which the service study attempts to solve are limited to a particular school, a particular teacher, or a particular classroom; or, the investigation may be limited to the collection of data regarding a particular problem. The procedure is more systematic than ordinary thinking, but less systematic and exact than strictly scientific research.

The service study, for example, may be concerned with whether a certain textbook is too difficult for a particular class; or to determine the difficulty of assignments or vocabulary; select motivating devices, or adapt materials to individual differences. The service study may also be far more extensive, as when it undertakes the determination of objectives for an entire course of study, applications of standard educational tests, development of project units for special classes, study of pupil groupings, or the construction of curricula which will be adapted to a given community or to the special needs of certain groups of pupils.

Previous summaries of this kind have been made by Baker (1), Lee (2), Maxfield (3), and Ingram (4). This study aims to include major contributions of the last five years, 1937-1942.

B. TYPES OF RESEARCH WORK

1. *Statistics of Blindness.*

The committee on Statistics for the Blind makes an annual survey of "Eye Conditions Among Pupils in Schools for the Blind," (5) under the direction of C. Edith Kerby and Evelyn C. McKay. This survey presents data on causes of blindness; degree of vision remaining; present age of pupils; and age at onset of blindness. The report for 1939-40 surveyed 4,644 pupils in 45 schools for the blind, "Approximately three-fourths of the entire group receiving special education as blind persons." The importance of such facts as this survey presents for the administrator in educational prescription and prognosis cannot be questioned; and yet twelve schools for the blind were not represented in this report.

The educational uses which schools can make of such studies is illustrated by the "Survey of Pupils at Perkins Institution with Respect to Vision, Intelligence, and Hearing," by Janet H. Cairns (6). The

author says that such a survey might ultimately lead to the reshaping of a general program and the adoption of changes in policy; it serves immediately to focus attention upon the specific pupils at the extremes of the distribution. "This leads to a thorough case study and constructive suggestions for better adjustment."

Neal Quimby suggests that "many schools have no reliable records of the activities or economic conditions" of their graduates (7). The social and welfare agencies might well cooperate in more frequent alumni surveys.

2. *Psychology of Blindness.*

In the past, individual blind persons have contributed much to our understanding of the psychological problems of the blind. The works of Villey-Desmeserets (8), and Cutsforth (9) are outstanding examples. The biographies of Latimer (10) and Bretz (11) and Ohnstad (12) are more recent illustrations. Analytical studies of the biographies of blind persons should afford illumination of many educational problems; as well as affording valuable sources of curriculum material.

In his "Contributions to a Psychology of Blindness," (13) Samuel P. Hayes discusses such problems as sensory compensation, facial vision, and the memory of blind children; and concludes that "in memory, as in sensation, compensation is not a gift, but the reward of persistent effort." (p. 79).

"A Comparison of the Size and Space Concepts of Blind and Seeing Children," (14) was made by Elizabeth S. Hall at the University of Oregon. She devised an ingenious series of tests to measure the blind child's judgment of sizes of objects in terms of his own body. This study presents helpful suggestions for further research as to the space concepts of the blind.

In a recently published article (15), Harry Spar, of the New York Institute, suggests a number of research problems with special relation to the orientation and expression of blind persons. He believes that the extent to which auditory localization can be developed and trained would be a fruitful subject for research.

Viktor Lowenfeld's volume on "The Nature of Creative Activity" (16) is a comparative study of the non-visual sources of aesthetic

experience and artistic skill. These non-visual sources of perceptual experience, the author designates as "haptic perception," which he defines as "The synthesis between the tactile perceptions of external reality and those subjective experiences that seem to be so closely bound up with the experiences of the self." Lowenfeld concludes that the self or ego of the blind person organizes this non-visual perceptual experience according to autonomous aesthetic categories. Not since the famous "Problem of Mollineaux," in the days of Valentine Hauy put to rout the followers of John Locke's empirical psychology, has a book on the blind appeared, which is of greater interest and import to the philosopher.

3. *Personality Adjustment.*

Dr. Gabriel Farrell, of the Perkins Institution, insists that the educational program of the blind should be characterized by the mental hygiene approach (17). And Dr. C. B. Minner contends (18) that—

Residential schools have too often "tended to forget the individual blind person as a living human being needing adjustment often more than he needs the available kind of education."

He goes on to declare that "unless our residential schools can achieve and make use of this enlightened point of view they will continue to fall short in their efforts to justify their existence."

Dr. H. E. Chamberlin (19) analyzes the mental hygiene problems of the blind; and suggests means of approach and methods of treatment.

"Professional clarification and evaluation of pioneering practices now obsolete though practical and effective, should be instituted" he says, "and the interpretation of human conduct motivated by this handicap be made in accordance with new concepts of emotional life."

After rating groups of blind, deaf, and crippled children on the Vineland Social Maturity Scale, Katherine P. Bradway concluded that blindness presents the greatest social handicap (20).

Blind and sighted high school seniors were tested by Paul A. Brown on two personality tests: The Clark Revision of the Thurstone Schedule (21); and the Neymann-Kohlstedt Test for Introversion-Extroversion (22). On the first test, he found slightly higher neurotic tendencies among the blind. On the second test, he found the un-

expected result that blind boys are more extrovertive than the sighted; this result he attributes to over-compensation. Dr. Ibriham Yasa of the New York Institute has begun a comparative study of Optimism-Pessimism reactions on a test which he devised and used at Cornell University (23).

The adjustment problems of the newly blind child are of concern to schools. Beatrice F. Holzer describes the work of the social service department of the Eye Institute of the Medical Center in New York City (24). The author discusses principles and methods of social and psychological adjustment of the newly blind with many illustrative case studies.

Milton H. Klein (25) recommends case work treatment directed toward removing extreme attitudes of rebellion, or resignation.

Programs of personal and social guidance at various residential schools for the blind are described by Dorothy Post, of Virginia (26); Sharon A. Cromeenes, of Montana (27); and Joseph T. Cauffman, of Michigan (28).

Anyone who has ever tried to give an intelligence test to a blind child knows that you cannot get a reliable test from a child who will not respond, from whom you can get no emotional reaction whatever.

Conditions to which blind children are often subjected make withdrawal from reality a common reaction, and produce introvertive types and infantile regressions of greater or less severity, leading perhaps to incipient stages of hebephrenic schizophrenia.

At the New York Institute, the Vineland Social Maturity Scale, the Bell Adjustment Inventory, and the Wrenn Study Habits Inventory, have been used in diagnosing special cases and giving remedial suggestions.

4. *The Pre-School Blind Child.*

The care of the pre-school blind child is a subject of great importance and interest, to judge by the abundance of literature. Dr. Kathryn E. Maxfield, on the basis of her experience, presents an outline of a proposed program of research in this field, which is deserving of continued consideration (29). Dr. Maxfield's study of the spoken language of the pre-school blind child offers helpful guidance

in experimental procedures and methods (30).

A notable contribution to the understanding of the pre-school blind child was made by Martha L. Taber, of the New York Institute (31). Miss Taber studied the responses of a totally blind child to normal home life and reported measurable improvement in independence, initiative, behaviour, conversation, emotional responses, mental ability, and health. This thesis affords a useful and objective record of the effects of each method used.

Statistical formulae were applied in computing agreement between two analyses of personality and guidance records. An interesting outcome was the effect of improved environment on this child, raising his I. Q. from 67 to 87 in 20 months. This result is in harmony with similar results reported by Dr. Beth Wellman at the Iowa Orphans' Home (96).

A number of reports of methods and results at pre-school centers for blind children are available: notably, that of Byron Bershaw (32), of Minnesota; Harriet E. Totman, of Cleveland (33); and Olive McVickar, of Boston (34).

5. *Physiotherapy.*

A number of workers have been concerned with the problems of physical health, and physical education; posture, nutrition; and medical care.

At the New York Institute, a study of the incidence of tuberculosis among blind children was made by Dr. Camille Kereszturi (35); a critical analysis of playground activities for the blind child was undertaken by George Emmanuel (36); and Clyde Downs is recording the achievements of blind boys by means of the Brace Motor Ability Tests.

At the Iowa school, M. B. Landis reports on the results of socialization of blind children through athletics; and correction of postural defects in physical education classes (37).

The systemizing of procedures in the latter field included the following:

1. Physical examinations.
2. Organization of homogeneous groups.
3. Instruction in body mechanics.

4. Organization and teaching of an exercise system.
5. Repeated series of tests of results of instruction in each group.

6. *Speech Correction.*

No general survey of speech correction work in schools for the blind has been made since Sara Stinchfield Hawk, in 1926, reported that 48% of blind children suffered from speech defects. Mr. S. V. Waterhouse reports that speech tests given in four eastern schools show a very high percent of speech disorders among their pupils (38).

The regressive tendencies of the blind are reflected in their voices, writes Morgan (39). "Teach the child who appears timid how to use his voice effectively, and the effect of a strong and positive voice on other children will build up self-confidence in the child who speaks effectively."

A helpful analysis of the problems of teaching oral speech is given us by Mrs. Alma Reid of Iowa school (40). She points out that oral expression occupies thirty percent of communication time in adult life; written expression, only nine percent. But in school time allotted to the language arts, written expression receives thirty percent of the time, and oral expression only nine percent.

At the New York Institute, Hellen Nagy has been making a systematic study of the values of the moto-kinaesthetic method. She has made an analysis of the typical speech disorders of blind children, with remedial treatment prescribed for each and periodical speech recordings to test progress. She has constructed a working model to demonstrate to the blind the operation of the speech organs.

7. *Intelligence Testing.*

In his *Contributions to a Psychology of Blindness* (13), Dr. S. P. Hayes sketches the history of intelligence testing of blind children in which work he has had such a creative and directing influence. In his chapter on "Mental Measurements in Schools for the Blind," Dr. Hayes explains his adaptation and standardization of the Stanford-Binet test for the blind; and presents evidence of its validity and reliability. Dr. Hayes has under way a new adaptation of the Hayes-Binet test standardized upon the blind in residential schools. Dr. Hayes bases his work upon the results of between two and three thousand tests which

have been given under his general direction in schools for the blind.

Progress has been made in standardizing the Kuhlman-Anderson group intelligence test for the blind.

Mrs. Ethel N. Fortner who adopted the test reports the results of its use in three schools (41). A total of 151 children were tested and their scores compared with the scores on the Hayes-Binet Intelligence Test; a significant correlation was found.

In our work at the New York Institute we have used in addition to the Hayes-Binet, the Wechsler-Bellevue; the Kuhlman-Anderson and the Otis group tests. The results on the Kuhlman-Anderson seldom vary more than ten points from the Hayes-Binet; though there is still considerable work to be done in standardizing the time element on the Kuhlman-Anderson. The Otis Mental Ability test gives a correlation with the Hayes-Binet of 0.75. On the whole, the Wechsler-Bellevue individual test is the most satisfactory, because its results more often synchronize with school progress reports and clinical observation.

We have also had some experience in administering the College Entrance Board Scholastic Aptitude Test for the blind (42).

In this test, paragraphs which the sighted can observe as a whole in their entirety, are recorded on the talking book and given to the blind orally, seriatim. It seems a fair question whether it is valid to judge scholastic aptitude merely upon the basis of auditory discrimination; though auditory endurance is, no doubt, one of the requirements for an advanced degree.

Dr. Merle E. Frampton has pointed out the limitations of the I. Q. as applied to the blind (43). He maintains that the Blind I. Q. is not synonymous with blind intelligence. He calls attention to the many variable factors which affect the validity of each original I. Q. viz: Variation in standard of scoring by various testers; emotional inhibitions or lack of raport at the time of testing; lack of experience on account of blindness in the language or subject matter of the tests; the fact that these are verbal and not performance tests; age of blinding and degree of vision, etc., etc.

In a cogent article (44), George Lavos raises many pertinent questions concerning the adaptation of tests for the handicapped. He

questions seriously, the direct adaptation of sighted tests to the blind. The attempt to turn visual tests into tactile tests he suggests may alter the psychological nature of the test and affect its validity. Similar questions have been raised concerning various items in the Hayes-Binet; their questionable age-placement; their unsuitability for the blind; the test's lack of discrimination in borderline cases; and its unsatisfactory results with pre-school children.

Both Kuhlman and Otis were so impressed by the fact that group intelligence tests require some degree of school knowledge, that they recommended the abandonment of the designation I. Q. for the results of such tests, and the substitution of a Classification Index. Since social and educational experience or the lack of them are such important factors in the I. Q. for the blind it would seem that the result of the individual intelligence test too, ought to be regarded more as a classification index than as a true I. Q.

There is need for the development of performance tests to supplement the present verbal methods; especially in testing young children just entering school.

8. *Educational Achievement Testing.*

In his "Contributions to a Psychology of Blindness," (13) Dr. S. P. Hayes discusses the "Measurement of Educational Achievement in Schools for the Blind." In a series of chapters Dr. Hayes reprints the achievement tests which he has adopted; reports the results of their use in a score of schools for the blind; gives instructions on administering tests and handling results; and generalizes on the achievements of blind school children in various subjects. In general, he "finds an age-grade retardation averaging from two to three years in most residential schools," and "indirect evidence pointing to a similar retardation in the development of intelligence."

Dr. B. F. Holland, consulting psychologist for the Texas school, administered the Morrison-McCall Spelling Scale to control groups of blind and sighted pupils (45). He found the blind considerably below the marks for each grade in spelling brightness; and analyzes some of the factors in learning which might be responsible for the result.

The educational achievement of fifth and sixth grade blind children was tested by Georgia L. Abel, of the Iowa school, by means of her

own adaptation of the Unit Scales of Attainment in ten school subjects (46). The author presents correlations of relationship, and discusses the problems of adapting and standardizing such tests.

A nation-wide survey of braille reading was made by W. R. Niday (47). He directed the administration of the Monroe Standardized Reading test to 2,600 braille readers in Grades 3-12 in 39 schools. He reported that the sighted read two and one-third times as fast as the blind. The speed of reading braille varied from 2-120 words per minute in Grade 3 up to 6-95 words per minute in Grade 12.

At the New York Institute, a study was made of the results of the Stanford Achievement tests given over a four-year period. This study traces the progress of four classes from Grades 4 through 6. Tables were presented to show the progress of each class by grades and by subjects.

The New York Reading Progress tests developed by the State Education Department, have been adapted for braille reading, by the New York Institute staff (48). The McCall Standard Test Lessons in Reading have also been used here. In addition to these silent reading tests, Dorothy Nelson has devised tests in oral reading and in braille writing; these form a regular feature of Junior and Senior high school promotion.

The results of our tests show some interesting facts about the reading of our children. Pupils can read Braille Grade 1½ silently from two to three times as fast as they can read Standard English Braille. Our children with an average of 60 words per minute in Standard English Braille read from one-sixth to one-fourth as fast as the sighted. Tests were conducted using the Readers Digest which is in Standard English Braille. The results indicate that blind school children can read from one-tenth to one-third as fast as the sighted in this medium. On the average, the blind read about one-fifth as fast as the sighted in Standard English Braille; and from one-fifth to one-third as fast as the sighted in Braille Grade 1½.

It has been found that reading for "central thought," "reading for word meaning" and "reading for detailed understanding" require different time allotments for a fair test. Blind children can complete the New York State Progress Test in Word Meaning in practically

the same time as the sighted.

An important requirement of achievement tests, which is often overlooked in adapting them for the blind, is that tests must be selected or constructed in relation to the curriculum objectives which it is desired to test. School achievement tests, such as the Sohns-Harry, the Otis-Orleans, the Stanford, or the New York State Progress tests, make very definite assumptions as to the content of the curriculum. To try to test a curriculum built on one theory or education by tests built on another theory would be manifestly unfair and inefficient. As Lavos points out "Differing educational standards disqualify in some degree the valid administration of the common educational tests."

9. *Diagnostic Testing and Remedial Work.*

The educator, whose primary interest is pedagogical, is sometimes annoyed by the exponent of tests and measures whose primary interest is theoretical. The psychologist is devoted to his statistical research as of intrinsic value in itself. The educator views testing as a means to the end of the realization of educational objectives. He evaluates tests as they enable him to realize administrative or pedagogical objectives.

The limitations of the I. Q. for the blind are causing many educators to ask whether other tests, more analytical, diagnostic, clinical tests should not be sought or constructed, the results of which would point more directly to definite remedial treatment than the bare I. Q.

Diagnostic testing in relation to remedial work is a relatively new development; this perhaps explains the small amount of attention given to it in schools for the blind.

Also the data gathered by this method, relating to small groups, is less amenable to reliable statistical treatment, and hence of less interest to the student of large group trends. But such diagnostic tests are of great importance to the teacher and educator interested in small group remedial work. Fortunately, most modern textbooks now contain such diagnostic tests in connection with each unit of progress. One of the criteria for the selection of textbooks to be brailled should be the presence in the text of good tests for diagnostic and remedial work. Work along this line which should be mentioned are the theses of

Farris (49) and Doraiswamy (50), on the reading of the visually handicapped. At the New York Institute we have regarded these theses as so helpful as to have summaries made for the use of teachers. The contribution of Miss Olive Prine, while she was a teacher at the called to the attention of those wishing to construct tests in this subject (51).

The diagnostic testing and remedial work carried on at the New York Institute has been described by Dr. Merle E. Frampton in his volume "The Education of the Blind" (43). It includes the adaptation of such tests as the Gates-Russell Diagnostic Spelling Test; the Schorling-Clark-Potter Arithmetic Tests; the Inglis, and Illinois Basic Vocabulary Tests; etc. The Gray Oral Reading Tests and the New York Reading Progress Tests are followed by instructions to teachers as to the best methods of presenting various types of reading. Diagnostic testing to determine the causes of reading errors and possible remedies has been carried on by Hellen Nagy. The usual check-lists of reading errors for the sighted must be modified for the blind, and supplemented by items drawn from the mechanics of reading braille.

10. *Methods of Teaching.*

Numerous essays have been written on "How I Teach the Blind," but comparatively little scientific work has been done to demonstrate the actual superiority of one method over another.

At the New York Institute several tests have been conducted to determine the relative efficiency of the Talking Book and Braille. An effort was made to gauge the comprehension of *Readers Digest* material, which is in both mediums.

A greater amount of material can be covered in a given time (2½ times as much) by means of the Talking Book. Tests for the Comprehension of Central Thought show the Talking Book a few points in the lead. In tests for recall of details, the Braille is far superior.

In some quarters, there is opposition to excursions for the blind as a teaching method, on the ground that the little they see does not compensate for the trouble and risk. The values of excursions in teaching General Science are defended by D. H. Morgan who describes

excursions to factories, cold-storage plants, and an astronomical observatory (52).

The classes in Civics in the New York Institute, a few years ago, were taken on a boat trip around Manhattan Island; accompanying lecturers described points of interest. Control groups who remained in the classroom were instructed and tested on the same lecture material. There were so many variable and uncontrolled factors in this experiment that the results were inconclusive. Yet the method is suggestive of experiments which may be repeated to determine the values of excursions for the blind.

There has been increasing interest in the best methods of teaching Braille. Francis M. Andrews, Chairman of the Braille Committee of the American Association of Instructors of the Blind, sent questionnaires to sixty schools and Braille classes. The result was a comprehensive survey of present practices in our schools, with recommendations concerning the brailling of books (53). These recommendations call for the use of Standard English Braille beginning in the 7th Grade.

Anything that can be done to stimulate "reading readiness" on the part of blind children is a needed contribution. Dr. Kathryn Maxfield has made an extensive study of the pre-reading vocabulary of small blind children (54). The aim of this study was to familiarize children with words having a high degree of frequency in brailled primers and first readers. A large number of books was analyzed for the purpose of compiling a list of words the recognition and understanding of which would facilitate braille reading. Color words, and other visual terms which could have no meaning to a blind child were omitted. Suggestions are given for teaching this word list through experiences of the children.

"The Class Way to Standard English Braille" By Helen Wear describes the methods used in the Illinois school (55). Here Braille (Grade 2) is taught in the regular classroom through the year in the fifth and sixth grades, to prepare pupils for Grade 2 books now published for the seventh and eighth grades.

In connection with her work at the New York Institute and Teachers College, Madeleine S. Loomis has embodied her methods in a new textbook, entitled "You Can Learn Braille" (56).

One of the most outstanding contributions to the method of teaching braille in recent years, is the new series of readers for blind children in the Primary Grades developed under the direction of Emily Ellis at the New York Institute (57). Never before have primary books been prepared with special reference to the blind child. Not only have word frequency and interest been used as criteria, but also the problems of braille configuration and the mechanics of braille reading have for the first time been given consideration in the preparation of this series.

Braille music, and the best ways of writing and learning it, still afford some of the most troublesome problems in the education of the blind. Dr. B. F. Holland and Carl Fehr have made a study (58) of the various methods of learning musical selections: the effects of special factors, and special methods of training pupils to learn musical braille; and practices used in teaching instrumental music in schools for the blind.

Dr. Ernest Whitefield has conducted an inventory of practices in musical instruction at the New York Institute (59). His survey included such facts as the age of beginning musical instruction; age of beginning chief instrument; length of practice periods, and time allowed for practice; and facts concerning instruction in braille music notation.

11. *Technical Teaching Aids.*

More has been done in this field than in any other. The general aim is to discover new and more effective ways by which the senses of touch and hearing may be utilized in teaching and learning.

Many new technical devices have been developed to aid in the teaching of numerous school subjects. Notable examples are the adaptations in the teaching of geometry by D. H. Morgan, and J. A. Wellington (60); in physics, by H. J. Hebbeln (61); in natural science, by O. J. Hill (62); in mathematics, science, and recreation, by D. H. Morgan, and R. S. French (63).

At the New York Institute, Paul C. Mitchell has devised a system of braille chemical notations (64); and Clifford Low has invented new loom accessories and pattern guides to aid the blind in weaving (65).

The extent to which the radio is used in the education of the blind was investigated by Robert H. Barnhart (66).

Questionnaires covering the uses of Radio in the classroom were sent to 60 residential schools; 38 replied. Twenty-five schools take advantage of educational broadcasts during class time; 13 schools do not. After an analysis of the problems involved, the author recommends that "research in audio-learning be continued."

An extensive study on all aspects of the Talking Book in the education of the blind is being conducted by Dr. Berthold Lowenfeld, of the American Foundation for the Blind, with the aid of a grant from the Carnegie Foundation.

Lowenfeld arranged a catalogue of available recordings by grades and subjects, entitled *Learning by Listening* (67), which is proving of great service to our schools. Finding that titles for use below the Sixth Grade were limited, Lowenfeld directed the development of a series of records pedagogically adapted to the teaching of the social studies in the lower grades. In a recent publication, Lowenfeld lists the records available for use in history, geography, natural science and social studies; and gives suggestions for their use in developing activity units (68).

Recording machines have been used as an aid in teaching music by Elizabeth L. Stoltz of Ohio (69); and in remedial speech work, by Hellen Nagy of the New York Institute.

The construction of models for use in teaching the blind has evoked considerable interest. Experimental work along this line at Perkins Institution, the Michigan School, Western Pennsylvania School, and the Ohio School has been described by such authors as E. J. Waterhouse (70), O. J. Hill (71), Alice Chatfield (72), and Berthold Lowenfeld (73).

Models of the buildings of the New York World's Fair were made available to Eastern Schools through the cooperation of the New Jersey Commission for the Blind, and the Passaic Public Schools.

The Models constructed at the Ohio School are described in a volume, entitled "Models for the Blind" (74). This work was carried on with the aid of the Works Progress Administration. These models

show the development of American History in six periods; each model showing the distinguishing characteristics of the period. Fifty sets of these models, together with teachers manuals, are soon to be made available to the schools.

12. *Curriculum Studies.*

The curricula in schools for the blind tend to follow local state courses of study.

Schools in states where curriculum revisions are under way, have opportunity to revise their courses in line with modern trends. The Virginia School, for example, took advantage of the opportunity to improve its curriculum when the Virginia State Course of Study was being revised under the direction of Dr. Hollis Caswell of Teachers College.

At the New York Institute, the author made surveys of current trends in the Junior High School (75), and current trends in the social studies (76), with implications and recommendations for changes in blind school curricula. The New York Institute Staff at the present time is in the process of adapting the new social studies program outlined by the State Education Department.

The elements which should enter into adequate course of study in reading for the primary grades have been studied by Alice Chatfield of the Ohio School (77).

A survey by questionnaire of the status and development of physics courses in schools and classes for the blind was undertaken by H. J. Hebbeln (78).

This survey included text material and laboratory facilities. Twenty-three of the thirty-five schools replying do not teach physics, on the ground that this subject is unsuited to the needs of pupils in schools for the blind.

Surveys of Commercial education in schools for the blind have been made by L. L. Geiger of Boston (79), and by A. L. Brown, of Colorado (80). Geiger presents a representative picture of what is being done in the commercial field in the schools for the blind, and suggests future possibilities.

Superintendent Brown surveyed the extent to which stenography,

typewriting, salesmanship, insurance selling, budgeting, and other commercial subjects are taught, and draws conclusions of value in guidance and curriculum building.

The most comprehensive survey of curricula in residential schools for the blind made in recent years is that of Dr. Neal F. Quimby (7). The large proportion of replies to his questionnaire assures a representative study. The author's conclusions and recommendations are worthy of more attention than can be given them in a limited space. Especially stimulating to the research worker are his suggestions as to further research.

13. *Vocational Guidance and Training.*

The American Association of Workers for the Blind, and the American Association of Instructors of the Blind, both of these professional organizations, have committees on vocational training. The reports of these committees, as found in organization Proceedings, furnish basic material for research workers in this field (81).

The latest report of the Industrial Arts Committee of the American Association of Instructors of the Blind is stimulating and valuable (82). The Chairman, Superintendent W. T. Scarberry of Ohio brings to the blind field the leadership of a specialist in industrial arts.

A plan for concerted action in promoting vocational guidance has been adapted by both professional organizations, and is being tried out in a number of schools.

The New York Institute for the Education of the Blind is one of the schools that is carrying on this experimentation. In connection with regular vocational guidance classes a number of aptitude tests are being used; among them, Miner's Analysis of Work Interests; and the Minnesota Manipulation, and Assembly Tests.

In a general discussion of guidance for the physically handicapped, Dr. Elise H. Martens raises some questions which are of vital interest to the blind (83). For example, she raises the question as to whether the Secondary School experience of handicapped children should be primarily cultural. Dr. Martens suggests that the high school years should give opportunity for exploratory occupational courses and experiences; and that the State Divisions of Vocational Rehabilitation

cooperate in placing handicapped students in carefully chosen part-time jobs on an exploratory basis.

The urgent need of research in vocational training and opportunities is emphasized by Dr. P. C. Potts (84). Conditions differ in each state, he says, and each school should make a comprehensive study of the opportunities open in its own state. This research should take up such problems as in which trades exploratory courses should be offered and whether specific training should be given in sheltered workshops, in a neighboring industrial arts school; or on the job as apprentices.

A useful reference work on this subject is Louise Wilber's "Vocations for the Visually Handicapped" (85). The method of this work is to present case studies of successful blind persons. There are, however, a few statistical studies furnished by alumni surveys of schools, social agencies, and special occupational groups such as the earnings of blind life-insurance agents.

Vocational Guidance at Perkins Institution is described by Dr. Gabriel Farrell (86). The method of his report is largely that of case studies and conclusions drawn from wide observation.

At that time Dr. Farrell wrote, "One year we worked on vocational tests but we have not been able to do as much as we would like in adapting these tests to the blind. This was due partly to lack of time and partly to our conviction that it is more important in these days to find out what there is for the blind to do, and then fit them for the jobs available."

Vocational Agriculture for the Blind at the Michigan School is described by Arthur Delawarter (87). At this school Smith-Hughes aid has been granted for courses in poultry raising, fruit growing, floriculture, and landscape gardening.

At the Minnesota School, Hedwin C. Anderson reports that students are placed in apprentice training jobs during their senior year, for which industrial credits are granted (88). Anderson describes a plan of vocational aptitude testing worth considering. He suggests that typical assembly operations be selected, to be performed under industrial work conditions. This would be, in effect, a work-sample test, correlated with industrial assembly jobs in industry. It might include such operations as assembling paper-box partitions, stuffing cloth ani-

mals, or making hand molded bricks.

Vocational Preparation and Placement at the Batavia School have been described in a number of reports by Eber L. Palmer (89).

There the method of apprenticeship has been adapted, students being placed out in industry on a part-time basis. Blind students from Batavia have served successfully as apprentices in newsstands; greenhouses; auto-service stations; poultry raising; fruit basket manufacture; dictaphone operators; power sewing machine, punch and drill press operators; and in repetitive factory operations.

Palmer contends that too much stress has been placed on defense employment for the blind, and asserts that now is the time to place the blind in non-defense work as a safeguard for the future.

14. *Organization and Administration.*

Committees of the American Association of Instructors of the Blind have made reports on various problems of administration. Mrs. M. G. Colville of Virginia presented a Committee report urging the adaptation of a uniform Statistical Report for Residential Schools (90).

Other Committees surveyed Institutional Costs. In reporting on maintenance costs per pupil, Harvey Blanton of the Maryland School urged that many schools need to install a modern accounting system (91). Superintendent Robert W. Woolston of the Illinois School, reported the results of a survey of cost per pupil, for instruction and educational supplies (92). He reported that, "One school raised its teachers' salaries 20% rather than lose them and begin all over again with inexperienced teachers."

In a survey of the status of teachers of the blind (93), Dr. Berthold Lowenfeld, found that teachers in schools for the blind have lower salaries and shorter tenure than public school teachers. Lowenfeld recommends a change in policy if schools for the blind are to retain their best teachers and uphold educational standards.

An experimental program for blind children in rural school districts is described by Marcella S. Cohen (94). This program was initiated by the Pennsylvania Association for the Blind.

For the past 15 years certain schools for the blind have been

sending some of their senior pupils to public high schools. A study of the results of this practice has been made by Alice T. Harvey of the Maryland School, who reports favorably upon the experiment (95).

CONCLUSIONS:

1. *Need for a More Scientific Approach.*

This survey of the literature on the blind makes it very evident that a more scientific approach is needed in research studies in this field. Greater care is needed in setting up studies, and in the evaluation of results to guard against unreliable conclusions.

The selection of problems for study should be made with some concern for the practical value of the conclusions. The problems chosen for research should be vital and practical, so that the solutions when found will be applicable to real needs.

Greater care should be taken in defining problems. Broad areas should be analyzed into measurable and comparable factors.

Methods of research should be chosen in harmony with the character of the problem, and the nature of the data. The comparison of control groups to test teaching methods, for example, has been used in only a few studies in the blind schools; more frequent use should be made of this method. A number of studies have been made comparing the blind with the sighted in certain abilities; such studies have more value in the field of general psychology than in the solution of the specific educational problems of the blind.

Questionnaire addicts should restrain themselves, or at least discipline themselves at the shrine of objectivity. The author of the questionnaire, should spend at least as much time and thought in framing his questions, as he expects his respondent to spend in answering them. The superintendents of schools for the blind would have more patience in answering such questionnaires if they felt that the result would be a body of objective and comparable data; they are less interested in a symposium of subjective opinions.

2. *Factors in a Successful Research Program.*

The most important factor in the success of a research program in a school for the blind is a constant administrative policy toward

research. To be successful many research projects require the gathering of a comparable objective data over a period of years. Such a long term program requires constancy of purpose. This means, an administration informed and sympathetic toward research worthwhile.

A second important factor in successful research is stable teacher tenure. The teacher is a central factor in the conduct of research. Teachers should be sufficiently trained to administer standard tests, gather data, interpret the results of tests, and apply the findings of research in practical ways. Successful educational research requires teachers who are intelligent and sympathetic in the various aspects of research work.

To secure this result, qualified teachers must be encouraged to take a professional attitude toward their work. Unless teachers can look forward to a career in this field they are not likely to be much interested in its research problems.

Another factor in successful research in this field is the degree of cooperation which can be secured among the various agencies involved.

Teachers colleges and state universities have afforded valuable technical guidance in numerous instances. Public and private agencies for the blind have much to contribute from their experience. There should be some central clearing house through which the schools for the blind can cooperate in setting up research projects. Such cooperative endeavor would prevent overlapping and duplication of effort, secure more objective and comparable data, and save the time of teachers and administrators.

3. *Needed Research.*

In previous surveys a number of authorities, such as Frampton, Maxfield, Baker, Hayes, Ingram, Quimby and others, have suggested types of research needed in the education of the blind. In addition, the authors of research studies have included suggestions for further work. These suggestions for needed research may be summarized under a few general heads:

First: General Psychological Problems of the visually handicapped. Under this heading we might include such groups of problems as the following:

(a) The nature of perception and association; space concepts; auditory-localization; orientation; and the effects of the absence of visual stimulation on mental processes.

(b) The effect of various degrees of vision and age of blinding upon educational processes.

(c) Types of psychopathic maladjustment, and remedies therefore.

(d) The psychology of the pre-school blind child with special reference to habit-training, enrichment of experience, and the effect of environment upon mental development.

Second: Research on certain problems of medical care and health might be conducted in connection with the schools. For example:

(a) The effects of nutrition, presence or absence of certain vitamins, upon various diseases and conditions of the eyes.

(b) The number and types of double-disabilities found in schools for the blind, and the bearing of these findings on the school program.

Third: The continuance of the intelligence testing program. At present, one-third of the schools for the blind do not use any standardized tests either of intelligence or educational achievement. There are numerous needs in this area.

(a) Research to determine the general level of mental ability of blind pupils, and the bearing of such findings on the curriculum.

(b) The development of performance tests for young blind children.

(c) The construction or adaptation of more efficient group intelligence and achievement tests. Administrators have expressed the desire for valid and reliable group tests which can be given in less time, for administrative purposes.

Fourth: *Research in Methods of Teaching.*

This is the field in which research is most needed, and in which the least real scientific work has been done. In many subjects, methods of teaching and the results of research may be transferred from sighted areas. It is in those subjects in which special tools of knowledge are required by the blind that special research is needed. Among these are reading, writing, spelling, and arithmetic. The relative efficiency

of the typewriter and the braille writer in teaching spelling, is an illustrative problem. New tests of the reading readiness of primary children for reading braille are needed. The adaptation of many of the new diagnostic tests in braille for the blind offers a practically untouched field.

Fifth: *Curriculum Research.*

Few would disagree with Quimby when he says, "It would seem advisable for educators of the blind to remedy this (present) situation through a reorganization of the curriculum," even though this might involve a "change in philosophy." Surely there is need for rethinking the educational objectives of the education of blind children, and reforming the curriculum so that these objectives may be realized most efficiently.

We can suggest only briefly the areas in which research of this type might prove most fruitful.

(a) Experiments in the correlation of subjects around major vocational and cultural interests. More consideration should be given to the values for the blind of survey courses in General Science, General Mathematics, and General Social Science.

(b) A critical study of all courses, but particularly of the arithmetic course, to eliminate materials of no practical use to the blind.

(c) Study should be made of the proportion of the pupils who would benefit from a course in practical mathematics in place of algebra or geometry.

(d) Study should be made of the time necessary to master the tool subjects, such as reading and arithmetic.

(e) The values of foreign languages for the average blind person and the time to be given to them, should be investigated.

(f) The subject of typewriting should be studied from the standpoints of: When to introduce the subject; how long it should take to master this skill; and its correlations with spelling and English.

(g) In the field of music there are a number of suitable research problems; such as, when to start piano lessons; the amount of time to give to practice periods; the relations of musical braille and literary braille in student's time and study; and the adaptation of musical aptitude tests.

(h) A series of studies might be conducted as to the best time in the pupil's course to introduce such subjects as Standard English Braille, the typewriter, the braille writer, and the various aspects of formal arithmetic.

(i) The plan of comparing the progress of blind pupils in public high school with those in a school for the blind is worthy of research study.

(j) Graduates who go on to college might well furnish the subjects of study of the factors entering into their academic success.

Sixth: *Vocational Guidance.*

Research in this field would continue the excellent work already initiated by the Vocational Guidance and Industrial Arts Committees of the two professional organizations. (A.A.W.B. and A.A.I.B.)

(a) The work of the placement agencies should be surveyed and analyzed and the results made available for the guidance of schools in their vocational training programs.

(b) Certain existing vocational interest tests, and mechanical aptitude tests, should be adapted for the blind.

(c) New vocational aptitude tests should be developed on the basis of typical industrial jobs in which the blind have the greatest probability of employment.

(d) The Work-Sample Program and Work-Sample Tests should be tried out on the basis of typical work experiences open to the blind.

(e) There should be continuous follow-up and scientific study of blind apprentices on the job.

(f) Continuous record and study should be made of the vocational careers of all alumni.

Seventh: Relation of Residential Schools to National Defense and Permanent Post-War Rehabilitation Programs.

An outstanding contribution to this area has been made by Dr. Merle E. Frampton, in his capacity as Chairman of the Teachers College Conference on the Exceptional Child and the Emergency, Blind Division. The general objective of the Conference was to examine existing service programs with a view of ascertaining their most effective application to our national defense program and to the

permanent post-war program for the area of the blind.

Under Dr. Frampton's guidance and direction the following concrete proposals were drafted and agreed upon:

I. It was resolved that a section for the blind in the United States Employment Service be established and provide adequate follow-up in their placement.

II. Resolved that the case work and placement departments of agencies for the blind be strengthened so that more information in regard to blind persons may be available, there may be a more careful selection of blind employees, and better follow-up procedures may be observed.

III. Resolved that there should be more research in the testing of vocational aptitudes of the blind.

IV. Resolved that there should be parallel research in regard to jobs which blind persons can perform satisfactorily.

V. Resolved that a carefully prepared program for the training and selection of additional persons for the systematic placement of blind people be established.

VI. Resolved that there should be a careful study of the place and function of the sheltered shop program in the total vocational program for the blind.

VII. Resolved that there be established on at least an experimental basis centers which will give an opportunity for the testing of blind persons on a practical basis and which will also afford an opportunity for their basic training.

VIII. Resolved that a study of general and specific training required for particular jobs and the best means by which this training may be supplied, be arranged.

IX. Resolved that a program for blinded service men similar to that outlined in the plan of the New York Association for the Blind be developed.

X. Resolved that the area of sight-saving be given careful consideration for possible adjustments for service in the war production program.

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